REMARKS

The above amendments to the above-captioned application along with the following remarks are being submitted as a full and complete response to the Official Action dated February 24, 2006. In view of the above amendments and the following remarks, the Examiner is respectfully requested to give due reconsideration to this application, to indicate the allowability of the claims, and to pass this case to issue.

Status of the Claims

Claims 1-6 and 9-10 are under consideration in this application. Claims 7-8 are being cancelled without prejudice or disclaimer. Claims 1-5 are being amended, as set forth in the above marked-up presentation of the claim amendments, in order to more particularly define and distinctly claim applicants' invention. New claims 9-10 are being added to recite other embodiments described in the specification.

The claims are being amended to correct formal errors and/or to better recite or describe the features of the present invention as claimed. All the amendments to the claims are supported by the specification. Applicants hereby submit that no new matter is being introduced into the application through the submission of this response.

Prior Art Rejection

Claims 7-8 were rejected under 35 U.S.C. §102(b) as being anticipated by JP 7-96525 (hereinafter "JP '525"), and claims 1-8 were rejected under 35 U.S.C. §103(a) as being unpatentable over JP '525 in view of JP 56-37145 (hereinafter "JP '145"), and over US 6,818,872 to Mitamura et al. (hereinafter "Mitamura"). These rejections have been carefully considered, but are most respectfully traversed, as more fully discussed below.

As Claims 7-8 are being cancelled without prejudice or disclaimer, the relevant rejection thus becomes moot.

The raw tire preheating method for preheating a raw tire 4 (Fig. 4) including metal members (e.g., "*such as belt member 56, bead wire 52 etc.*" p. 19, lines 10) embedded therein of the invention (for example, the embodiment depicted in Fig. 3), as now recited in claim 1, comprises: preheating said metal members inductively by means of a high frequency magnetic field (p. 4, last paragraph; S5 in Fig. 3); and transmitting radiative heat towards a portion of the raw tire embedded with one of said metal members (e.g., "*a rate-limiting portion*" p. 5, line 5, "*the rate-limiting portion (the end portions of the tread portion 4a)*" p. 18, lines 17-18, the end positions at 60 mm and -60 mm in Fig. 7 which got hot just by induction heat slower and reaching at a lower final temperature about 80°C; or a center portion of the tread portion 4a at 0 mm in Fig. 7 which got hot slower and reaching at a lower final temperature about 80°C) which is induced to generate heat lower than other portions of the raw tire embedded with other ones of said metal members (e.g., the peak positions at 40 mm and -40 mm in Fig. 7 which got hot faster and reaching at a higher final temperature about 100°C) so as to heat said raw tire evenly (S6 & S7 in Fig. 3; "*the rate-limiting portion, the temperature of which rises slowly under only the induction heating, is heated from the surface side by the radiation heating. By virtue of induction and radiation heating process above, each portion of the raw tire may be heated up to desirable temperature rapidly and certainly. Therefore, each portion of the raw tire may be heated up to desirable preheating temperature, and then the whole portion of the raw tire may be heated up to the vulcanizing start temperature in a short time in the vulcanization molding process*" p. 5, lines 5-12; p. 3, line 2).

The invention recited in claim 4 is directed to a raw tire preheating apparatus for preheating a raw tire 4 including metal members embedded therein (for example, the embodiment depicted in Fig. 1), comprising: (a) a retaining means 1 for retaining said raw tire 4 in a predetermined attitude in a releasable manner; (b) an induction heating means 11 for heating said metal members inductively by means of a high frequency magnetic field, said high frequency magnetic field being applied to said raw tire 4 retained by said retaining means 1; (c) at least one radiation heater 15a-15d targeting towards a portion of the raw tire embedded with one of said metal members which is induced by said induction heating means to generate heat lower than other portions of the raw tire embedded with other ones of said metal members so as to heat said raw tire evenly; and (d) a controller 30 for coordinating said induction heating means 11 and said radiation heater 15a-15d to heat said raw tire evenly.

By targeting the heaters 15b, 15c towards the end portions of the tread portion 4a in conjunction with the induction heating (Fig. 1; p. 18, lines 6-9), the temperatures of the end portions (60 mm, -60 mm) of the raw tire 4 were raised with the same heat-up rate as the other portions (e.g., 30 mm, -30 mm) or a higher heat-up rate as shown in Fig. 6 (p. 18, lines 14-15). In contrast, temperatures in the end portions (60 mm, -60 mm) and a center portion (0 mm) of the tread portion 4a under only induction heating rise at a smaller heat-up rate than the other portions (e.g., 40 mm, -40 mm) of the tread portion 4a (Fig. 7; p. 18, lines 17-22).

By targeting two additional heaters 15a, 15d towards the end portions of the tread portion 4a and the bead portion 4c (p. 21, lines 22-23) in conjunction with the induction heating and the heaters 15b, 15c (Fig. 8; p. 18, last paragraph), the temperatures of the end portions of the tread portion 4a (the line in "●" in Fig. 8) rise faster than the ones of the prior art only under induction heating (the line in "▲" in Fig. 8), and reach a higher final temperature over 70°C than the final temperature 40°C of the ones of the prior art. In addition, the temperatures of the bead portion 4c (the line in "○" in Fig. 8) rise slower than the ones of the prior art (the line in "Δ" in Fig. 8), and reach a lower final temperature below 50°C than the final temperature over 100°C of those in the prior art. With the four heaters 15a-15d, the heat-up rate of the end portions of the tread portion 4a (in "●") is higher than that of the bead portion 4c (in "○"), and even higher than that of the end portions of the tread portion 4a under only induction heating (in "▲") (p. 19, lines 4-7).

Applicants respectfully submit that none of cited prior art references discloses, teaches or suggests applying such a step of "transmitting radiative heat towards a portion of the raw tire embedded with one of said metal members which is induced to generate heat lower than other portions of the raw tire embedded with other ones of said metal members so as to heat said raw tire evenly" as recited in claim 1, or "at least one radiation heater 15a-15d targeting towards a portion of the raw tire embedded with one of said metal members which is induced by said induction heating means to generate heat lower than other portions of the raw tire embedded with other ones of said metal members so as to heat said raw tire evenly; and a controller 30 for coordinating said induction heating means 11 and said radiation heater 15a-15d to heat said raw tire evenly" as recited in claim 4 according to the invention.

In contrast, JP '525 (Fig. 2) and Mitamura (Figs. 14-15) use induction heating exclusively. As admitted by the Examiner, JP '525 "*lacks the aspect of employing a radiation heating* (p. 3, line 1 of the outstanding Office Action)," and Mitamura "*lacks the instant radiation heating means* (p. 3, last paragraph of the outstanding Office Action)." Therefore, they do not provide any teachings relevant to radiation heating, much less about "transmitting radiative heat t towards a portion of the raw tire embedded with one of said metal members which is induced to generate heat lower than other portions of the raw tire embedded with other ones of said metal members so as to heat said raw tire evenly" as the invention.

JP '145 was relied upon by the Examiner (p. 3, lines 1-2 of the outstanding Office Action) to teach "*employing a radiation heating.*" However, JP '145 only discloses alternatively radiating UHF heat towards the tire 3 set on a turntable 2 (p. 3, line 15 of the English translation; Figs. 1-2). Since JP '145 employs only radiation heating, but not any induction heating, it does not provide any "radiation heater 15a-15d targeting towards a portion of the raw tire embedded with one of said metal members which is induced by said induction heating means to generate heat lower than other portions of the raw tire embedded with other ones of said metal members so as to heat said raw tire evenly," or any "controller 30 for coordinating said induction heating means 11 and said radiation heater 15a-15d to heat said raw tire evenly."

Contrary to the Examiner's assertion that it is obvious to combine the references as suggested, Applicants respectfully contend that one skilled in the art would not have been motivated to do so as a matter of fact, since there is simply no reference available describe or suggest such combinations.

Even if, arguendo, one skilled in the art were motivated to combine the teachings in JP '525, JP '145, Mitamura, such combined teachings would still fall short in fully meeting the Applicants' claimed invention as set forth in claims 1 and 4 since, as discussed, there is no teaching of "transmitting radiative heat towards a portion of the raw tire embedded with one of said metal members which is induced to generate heat lower than other portions of the raw tire embedded with other ones of said metal members so as to heat said raw tire evenly" as recited in claim 1, or "at least one radiation heater 15a-15d targeting towards a portion of the raw tire embedded with one of said metal members which is induced by said induction heating means to generate heat lower than other portions of the raw tire embedded with other ones of said metal members so as to heat said raw tire evenly; and a controller 30 for coordinating said induction heating means 11 and said radiation heater 15a-15d to heat said raw tire evenly" as recited in claim 4.

Applicants contend that JP '525, JP '145, Mitamura, and their combinations fail to teach or disclose each and every feature of the present invention as recited in at least independent claims 1 and 4. As such, the present invention as now claimed is distinguishable and thereby allowable over the rejections raised in the Office Action. The withdrawal of the outstanding prior art rejections is in order, and is respectfully solicited.

Double Patenting Rejections

Claims 1-8 were rejected under the judicially-created doctrine of obviousness-type double patenting as being unpatentable over claims 1-13 of Mitamura in view of JP '145, and were provisionally rejected over co-pending application 10/926,050 in view of JP '145.

Applicants contend that claim 1 of the application now recites a distinctive limitation of "transmitting radiative heat towards a portion of the raw tire embedded with one of said metal members which is induced to generate heat lower than other portions of the raw tire embedded with other ones of said metal members so as to heat said raw tire evenly," and claim 4 of the application now recites two distinctive limitations of "at least one radiation heater 15a-15d targeting towards a portion of the raw tire embedded with one of said metal members which is induced by said induction heating means to generate heat lower than other portions of the raw tire embedded with other ones of said metal members so as to heat said raw tire evenly" and "a controller 30 for coordinating said induction heating means 11 and said radiation heater 15a-15d to heat said raw tire evenly," that are absent from Mitamura and the co-pending application 10/926,050. Accordingly, the withdrawal of the outstanding double patenting rejections is in order, and is therefore respectfully solicited.

Conclusion

In view of all the above, clear and distinct differences as discussed exist between the present invention and the prior art references upon which the rejections in the Office Action rely, Applicant respectfully contends that the prior art references cannot anticipate the present invention or render the present invention obvious. Rather, the present invention as a whole is distinguishable, and thereby allowable over the prior art.

Favorable reconsideration of this application is respectfully solicited. Should there be any outstanding issues requiring discussion that would further the prosecution and allowance of the above-captioned application, the Examiner is invited to contact the Applicant's undersigned representative at the address and telephone number indicated below.

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